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Shiraishi et al.

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(54) **GAMING MACHINE AND METHODS OF UPGRADING GAME SYMBOLS IN AN OUTCOME OF A GAME**

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G07F 17/34 (2006.01)

(52) **U.S. Cl.**
CPC ***G07F 17/3213*** (2013.01); ***G07F 17/326*** (2013.01); ***G07F 17/3267*** (2013.01); ***G07F 17/34*** (2013.01)

(58) **Field of Classification Search**
CPC G07F 17/32
See application file for complete search history.

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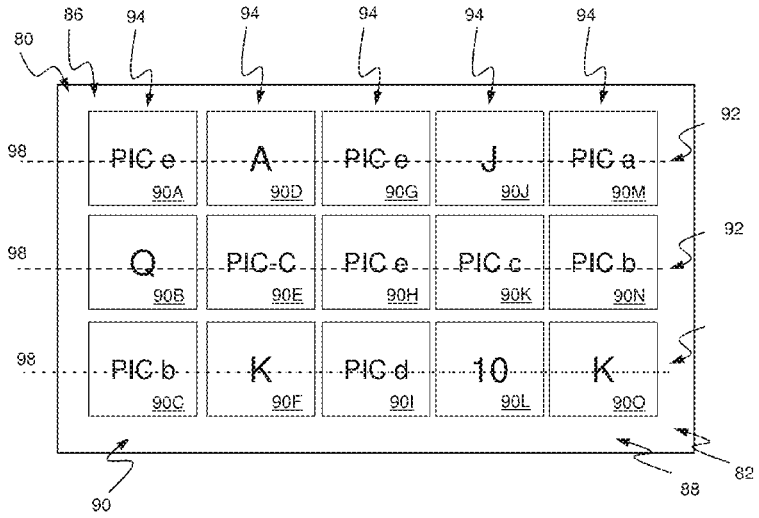
Primary Examiner — Omkar Deodhar
(74) *Attorney, Agent, or Firm* — Howard & Howard Attorneys PLLC

(57) **ABSTRACT**

A gaming machine and method allow a player to play a game. The game has an associated set of game symbols. The game symbols in the set of game symbols are arranged in a predetermined order from lowest to highest. A display device is configured to display a plurality of symbol regions arranged in a grid. The controller is configured to randomly select an initial outcome of the game. The initial outcome of the game includes an initial game symbol associated with each of the symbol regions. The controller detects a triggering condition associated with the initial outcome of the game and responsively replaces the initial game symbol in at least one predetermined symbol region with a replacement symbol to establish a secondary outcome of the game. The replacement symbol is determined as a function of the initial symbol and the predetermined order of the game symbols.

38 Claims, 8 Drawing Sheets



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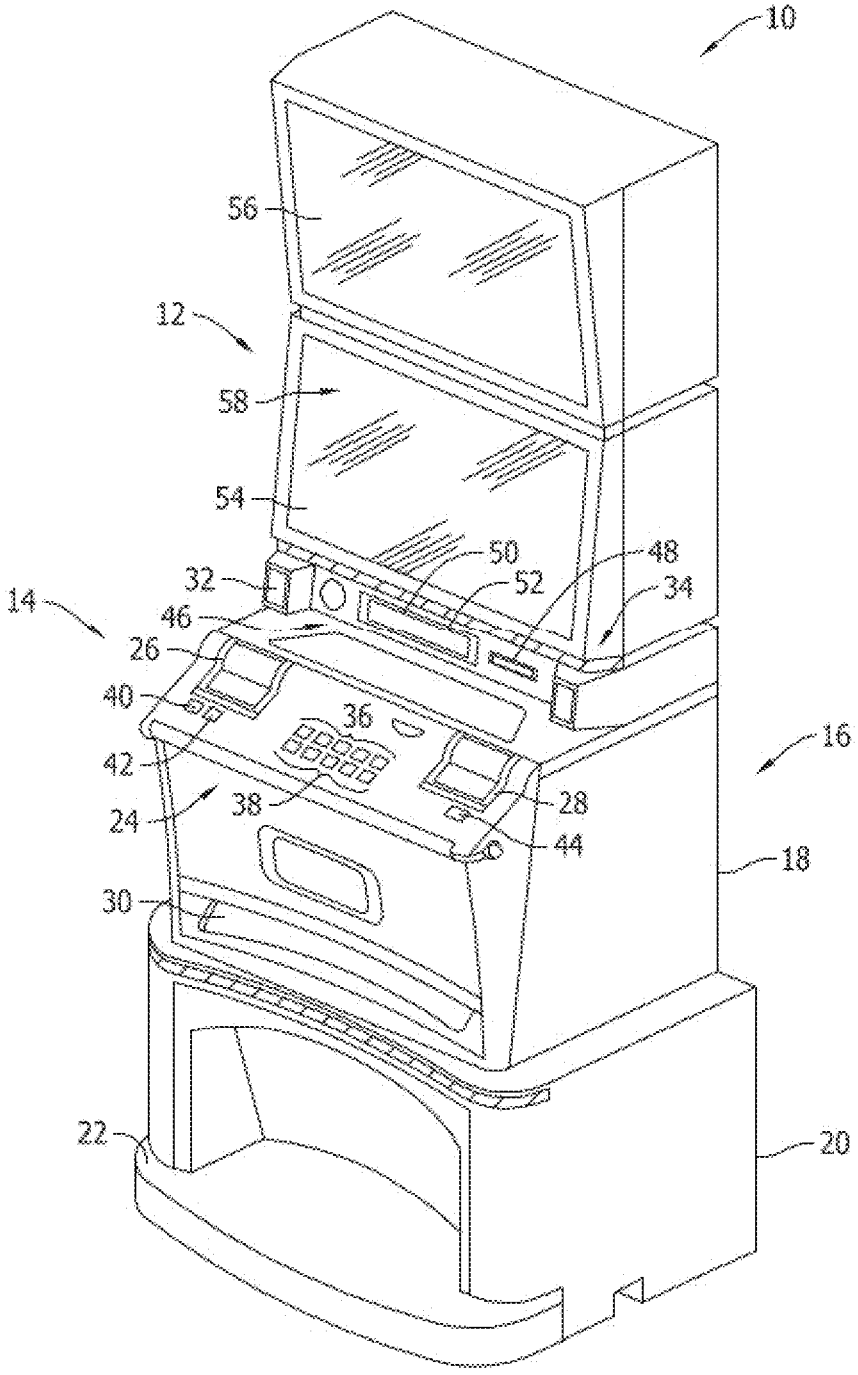
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Figure 1

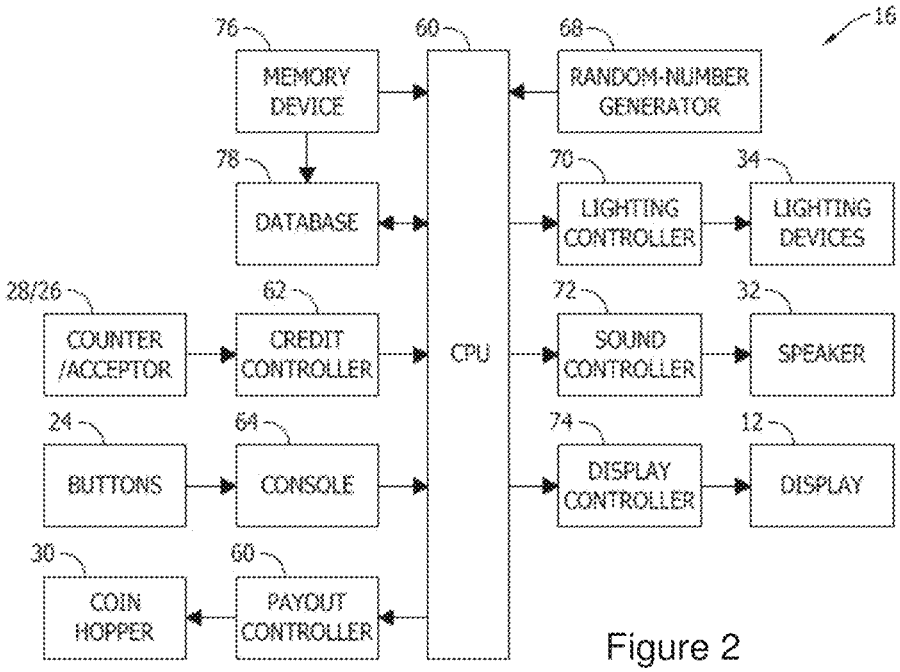

16
76
MEMORY DEVICE
60
68
RANDOM-NUMBER GENERATOR
78
DATABASE
70
LIGHTING CONTROLLER
34
LIGHTING DEVICES
28/26
COUNTER /ACCEPTOR
62
CREDIT CONTROLLER
CPU
72
SOUND CONTROLLER
32
SPEAKER
24
BUTTONS
64
CONSOLE
74
DISPLAY CONTROLLER
12
DISPLAY
30
COIN HOPPER
66
PAYOUT CONTROLLER

Figure 2

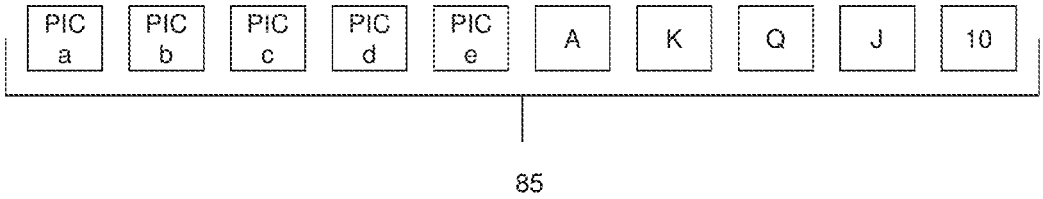


Figure 3A

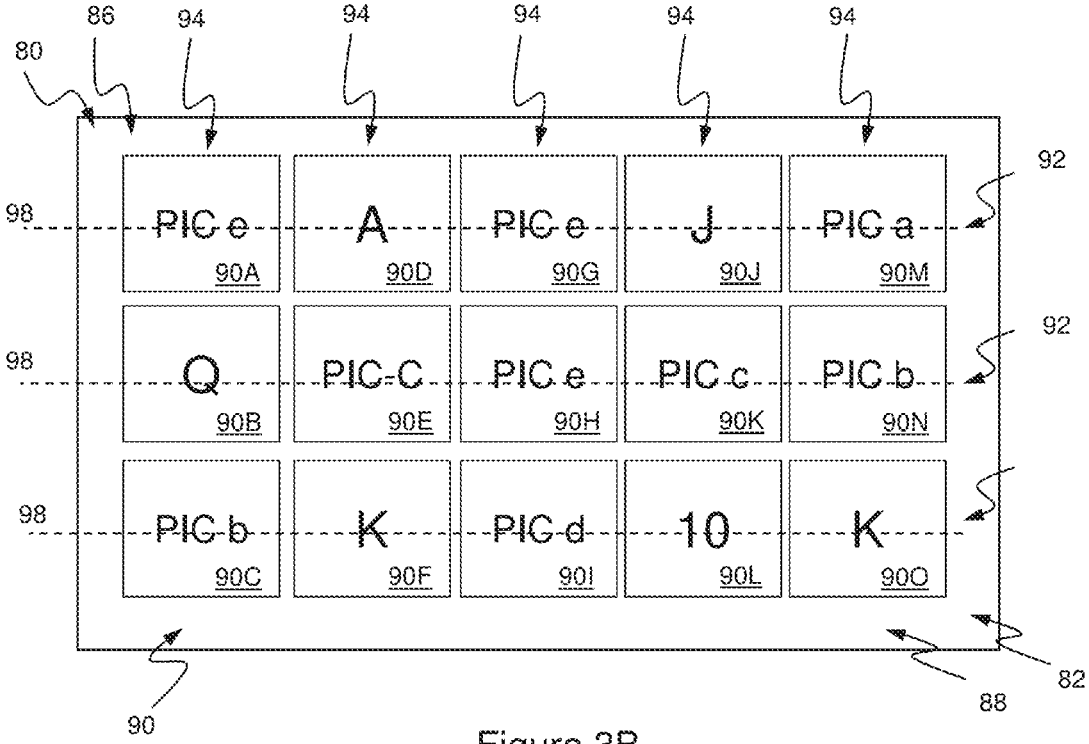
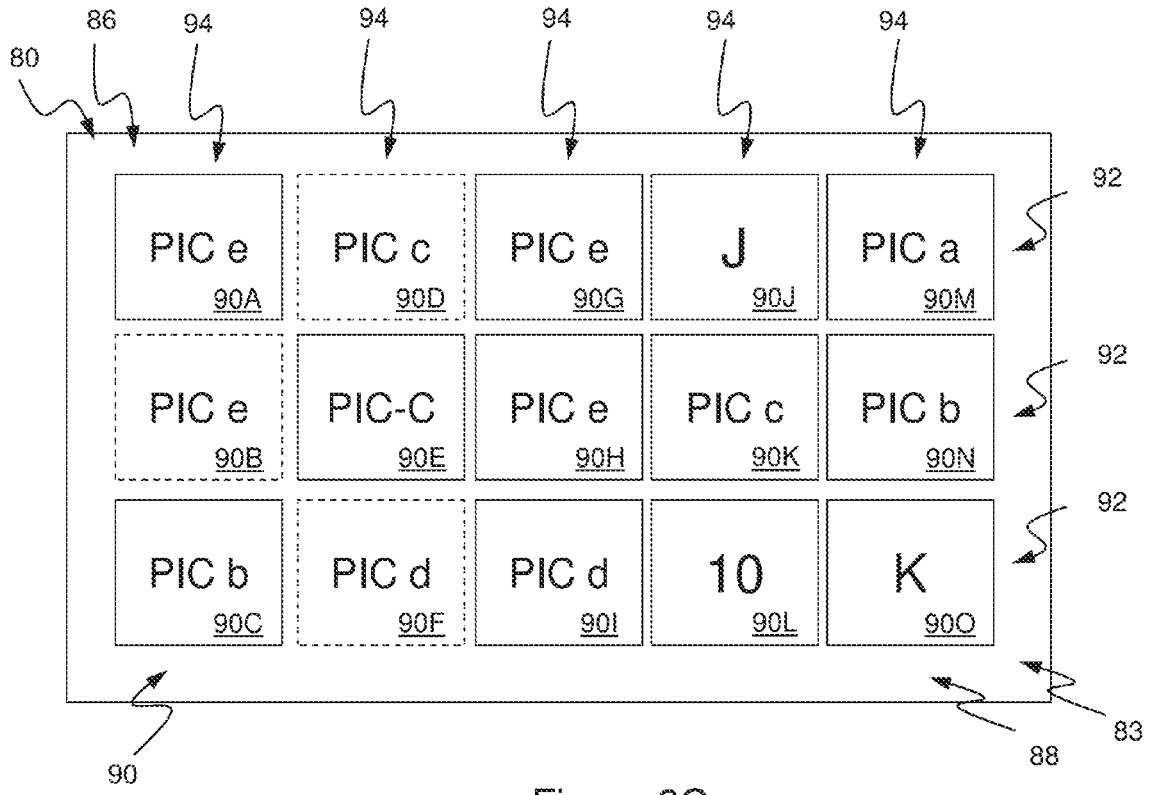


Figure 3B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PIC e
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90H
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90K
PIC b
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Figure 3C

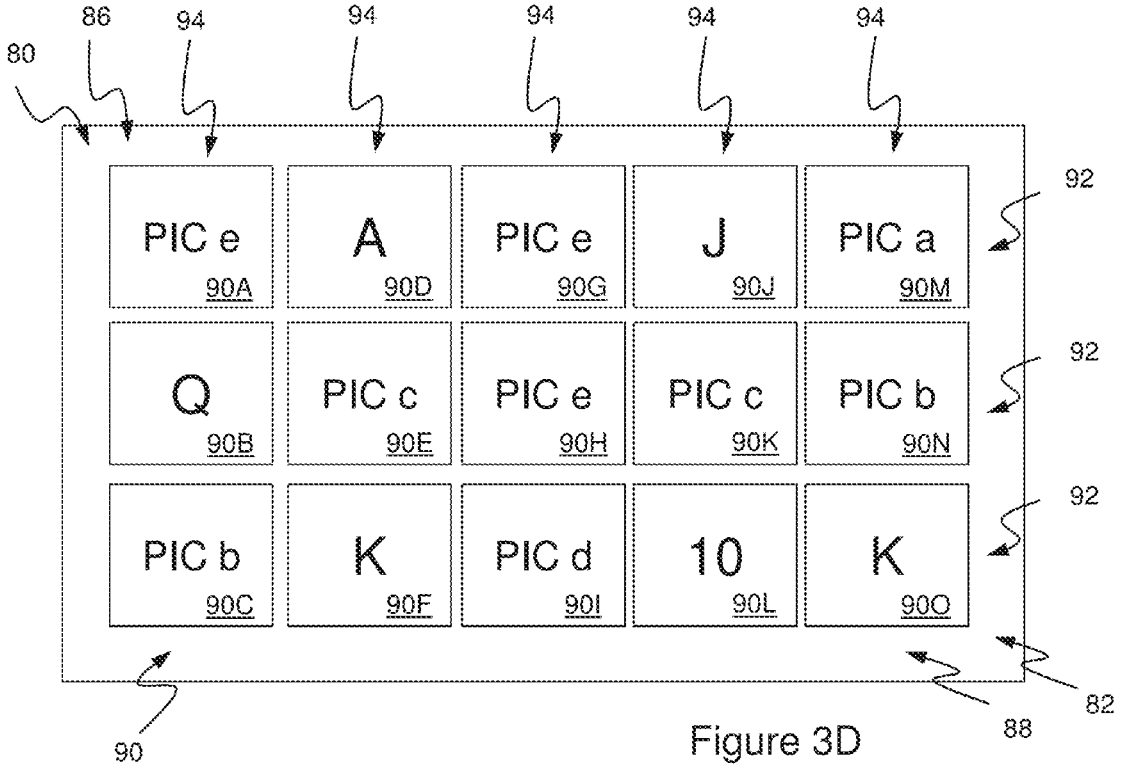

Figure 3D

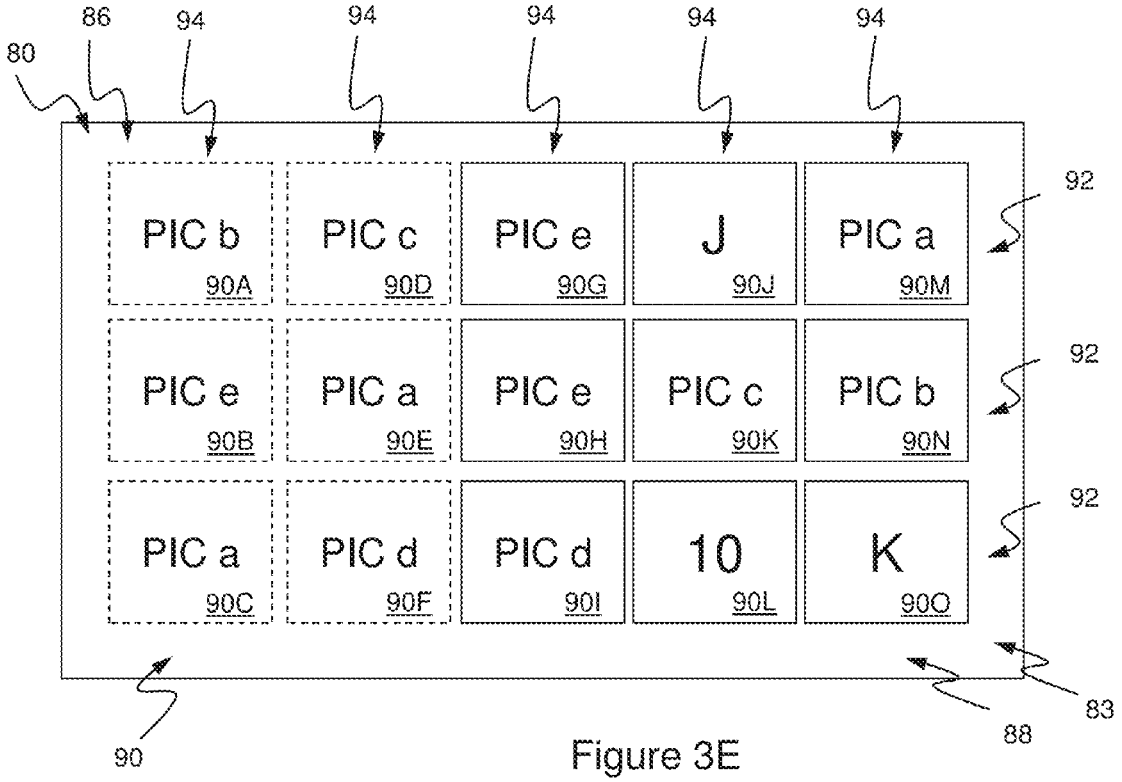

Figure 3E

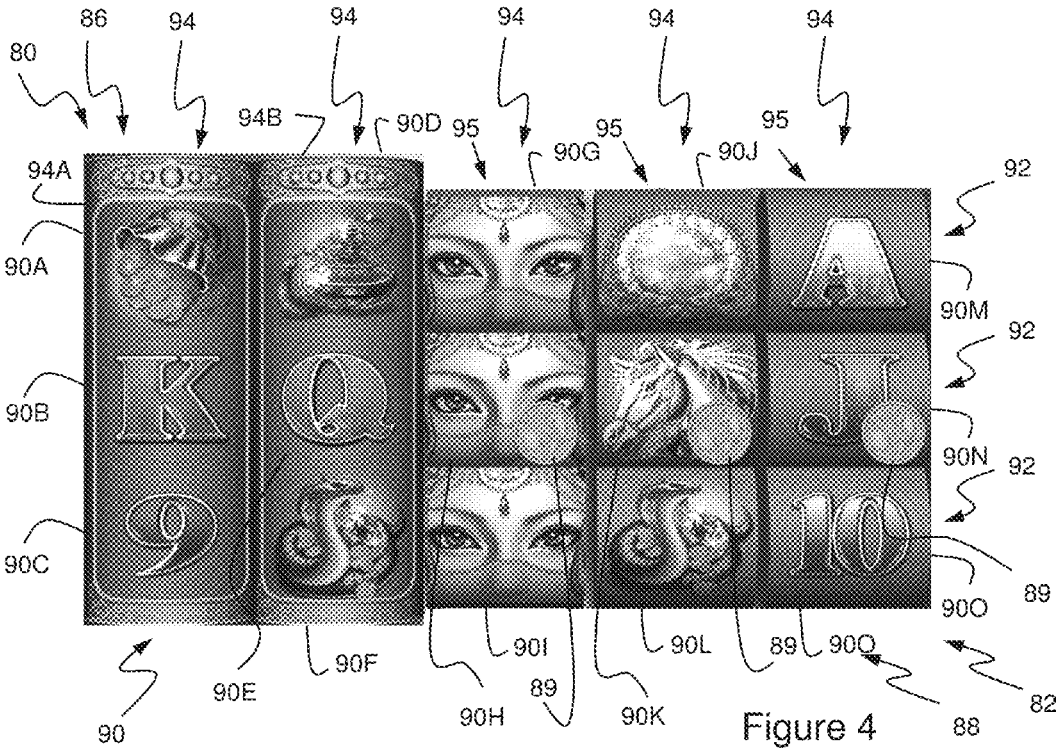

Figure 4

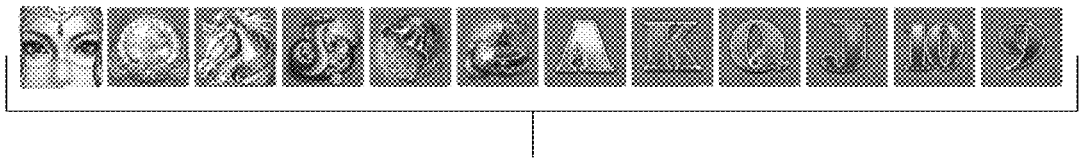

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Figure 5

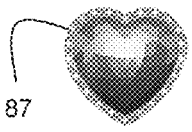

Figure 8

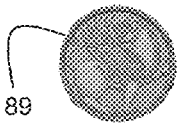

Figure 9

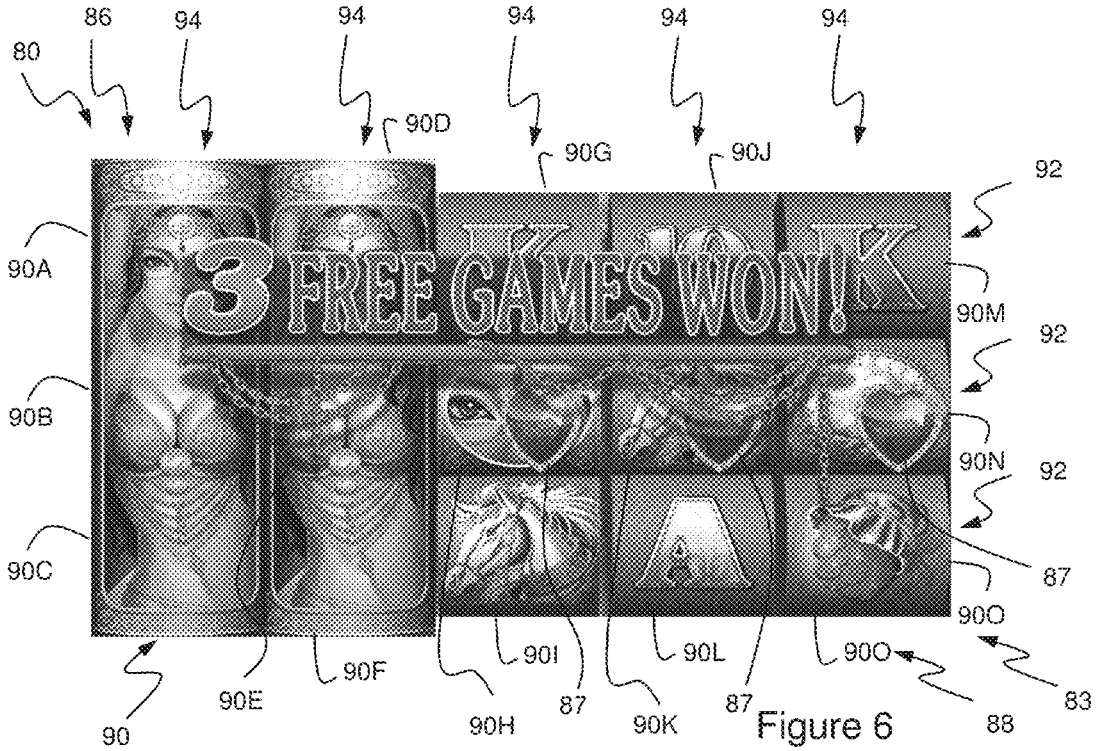

Figure 6

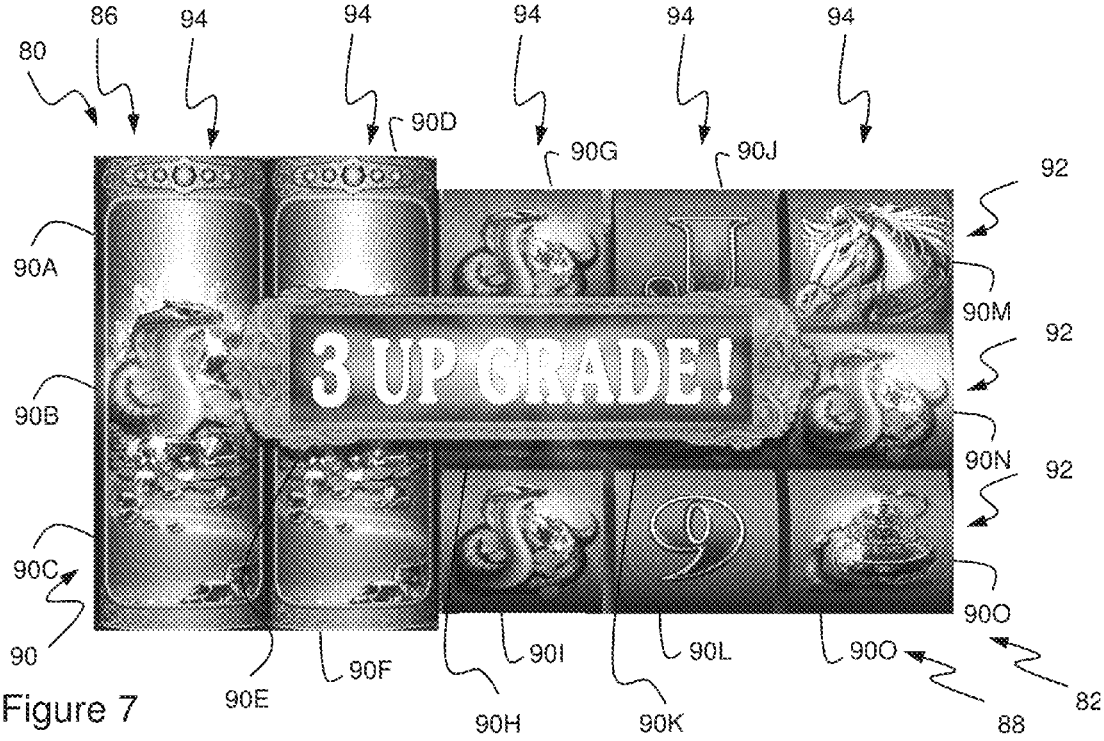

Figure 7

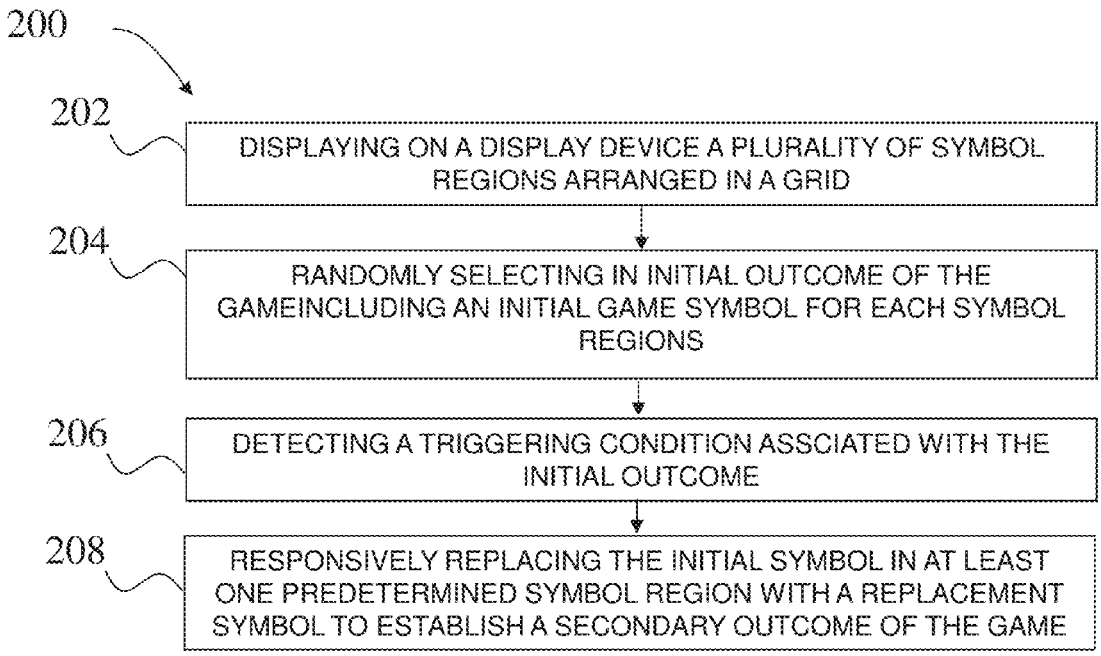

Figure 10

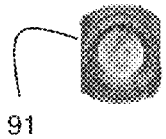

Figure 11

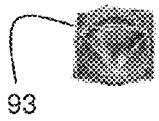

Figure 12

GAMING MACHINE AND METHODS OF UPGRADING GAME SYMBOLS IN AN OUTCOME OF A GAME

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation of U.S. patent application Ser. No. 14/225,304, filed Mar. 25, 2014, which claims priority to Australian Patent Application No. 2013231157, filed Sep. 23, 2013, the disclosures of which are hereby incorporated by reference in their entirety.

TECHNICAL FIELD

The subject matter disclosed herein relates generally to gaming machines and more particularly, to an apparatus and method for allowing players to play gaming machines having randomly selected symbols.

BACKGROUND OF THE INVENTION

Gaming machines, such as slot machines, are a cornerstone of the gaming industry. At least some known gaming machines include a video display device to display a reel game that includes a plurality of reels, wherein each reel includes a plurality of symbols. During game play, the gaming machine accepts a wager from a player, the player selects one or more paylines, the gaming machine spins the reels, and sequentially stops each reel to display the generated combination of symbols on the reels. The gaming machine then awards the player an award based on the combination of symbols orientated along the selected payline.

At least some known gaming machines display reels having a plurality of special symbols displayed within the reel. Known reels include a predefined number of special symbols displayed in each reel. Over time, during game play, the player may become aware of the number of special symbols that are displayed in each reel and may become frustrated because the number of special symbols within each reel remains constant for each game play. Accordingly, new features are necessary to appeal to player interest and enhance excitement in order to entice longer play and increased profitability. The present invention is directed to satisfying these needs.

SUMMARY OF THE INVENTION

In one aspect of the present invention, a gaming machine configured to allow a player to play a game is provided. The game has an associated set of game symbols. The game symbols in the set of game symbols are arranged in a predetermined order from lowest to highest. The gaming machine includes a display device and a controller. The display device is configured to display a plurality of symbol regions. The symbol regions are arranged in a grid. The display device is further configured to display one of the plurality of game symbols in each of the symbol regions. The controller is coupled to the display device and is configured to randomly select an initial outcome of the game. The initial outcome of the game includes an initial game symbol associated with each of the symbol regions. The controller is further configured to detect a triggering condition associated with the initial outcome of the game and to responsively replace the initial game symbol in at least one predetermined symbol region with a replacement symbol to establish a secondary outcome of the game. The replacement symbol is determined as a function of the initial symbol and the predetermined order of the game symbols.

In another aspect of the present invention, a method of providing a game to a player on a gaming machine having a display device is provided. The game has an associated set of game symbols. The game symbols in the set of game symbols being arranged in a predetermined order from lowest to highest. The method includes the step of displaying on the display device a plurality of symbol regions. The symbol regions are arranged in a grid. The method further includes the step of randomly selecting an initial outcome of the game. The initial outcome of the game includes an initial game symbol associated with each of the symbol regions. The method further includes the steps of detecting a triggering condition associated with the initial outcome of the game and responsively replacing the initial game symbol in at least one predetermined symbol region with a replacement symbol to establish a secondary outcome of the game. The replacement symbol being determined as a function of the initial symbol and the predetermined order of the game symbols.

In yet another aspect of the present invention, a non-transitory information recording medium on which a computer readable program is recorded is provided. The computer readable program causes a computer to function as a gaming machine that is configured to allow a player to play a game. The game having an associated set of game symbols. The game symbols in the set of game symbols are arranged in a predetermined order from lowest to highest. The program causes the computer to function as a controller coupled to a display device. The display device is configured to display a plurality of symbol regions. The symbol regions are arranged in a grid. The display device is further configured to display one of the plurality of game symbols in each of the symbol regions. The controller is configured to randomly select an initial outcome of the game. The initial outcome of the game includes an initial game symbol associated with each of the symbol regions. The controller is further configured to detect a triggering condition associated with the initial outcome of the game and to responsively replace the initial game symbol in at least one predetermined symbol region with a replacement symbol to establish a secondary outcome of the game. The replacement symbol is determined as a function of the initial symbol and the predetermined order of the game symbols.

BRIEF DESCRIPTION OF THE DRAWINGS

Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. **1** is a perspective view of an exemplary gaming machine of the present invention;

FIG. **2** is a schematic representation of the gaming machine shown in FIG. **1**;

FIG. **3**A is a diagrammatic representation of a set of game symbols being arranged in a predetermined order from lowest to highest, according to an embodiment of the present invention;

FIG. **3**B is a first diagrammatical representation of a display of a video slot game, according to a first embodiment of the present invention;

FIG. **3**C is a second diagrammatical display of a video slot game, according to the embodiment of FIG. **3**B;

FIG. **3**D is a first diagrammatical representation of a display of a video slot game, according to a second embodiment of the present invention;

FIG. **3**E is a first diagrammatical representation of a display of a video slot game, according to a second embodiment of the present invention;

FIG. **4** is a graphical representation of a portion of the gaming machine shown in FIG. **1** including an exemplary video slot game illustrating a plurality of slot reels, according to an embodiment of the present invention;

FIG. **5** is a graphical representation of a set of game symbols used in the video slot game of FIG. **4**;

FIG. **6** is a second graphical representation of a portion of the gaming machine shown in FIG. **1** including an exemplary video slot game illustrating a plurality of slot reels, according to an embodiment of the present invention;

FIG. **7** is a third graphical representation of a portion of the gaming machine shown in FIG. **1** including an exemplary video slot game illustrating a plurality of slot reels, according to an embodiment of the present invention;

FIG. **8** is a graphical representation of a scatter symbol used in the exemplary video slot game, according to an embodiment of the present invention;

FIG. **9** is a graphical representation of a second scatter symbol used in the exemplary video slot game, according to an embodiment of the present invention;

FIG. **10** is a flow diagram of a method for providing a game to a player according to an embodiment of the present invention;

FIG. **11** is a graphical representation of a first predetermined symbol, according to another embodiment of the present invention; and,

FIG. **12** is a graphical representation of a second predetermined symbol, according to another embodiment of the present invention.

Corresponding reference characters indicate corresponding parts throughout the drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the drawings and in operation, the present invention overcomes at least some of the disadvantages of known gaming machines by providing a gaming machine that displays a game having a plurality of game symbol regions and upgrades the symbols located in predetermined one or more game symbol regions in response to detecting a trigger symbol.

In general, the gaming machine **10** allows a player to initiate a gaming session to play a game, such as a video slot game, via the gaming machine **10**. The gaming machine **10** displays a game, accepts a wager on the game, generates a game outcome including a plurality of symbols displayed in a plurality of symbol positions, and provides an award to the player if a winning combination is displayed in the generated game outcome. The gaming machine **10** randomly generates a game outcome, spins and stops the reel to display the generated game outcome, and provides an award to the player if a winning combination appears in the game outcome.

A selected embodiment of the present invention will now be explained with reference to the drawings. It will be apparent to those skilled in the art from this disclosure that the following description of the embodiment of the present invention is provided for illustration only and not for the purpose of limiting the invention as defined by the appended claims and their equivalents.

FIG. **1** is a perspective view of an exemplary gaming machine **10**. FIG. **2** is a schematic representation of the gaming machine **10**. In the illustrated embodiment of the present invention is a video gaming machine preferably installed in a casino. However, the gaming machine **10** may be a personal computer, laptop, cell phone, smartphone, tablet computer, personal data assistant, and/or any suitable computing device that enables a player play the game. In the illustrated embodiment, the gaming machine **10** includes a display device **12** for displaying a plurality of games, a user input device **14** to enable a player to interface with the gaming machine **10**, and a gaming controller **16** that is operatively coupled to the display device **12** and the user input device **14** to enable a player to play games displayed on the display device **12**. The gaming machine **10** also includes a cabinet assembly **18** that is configured to support the display device **12**, the user input device **14**, and/or the gaming controller **16** from a gaming stand **20** and/or a supporting surface **22**.

The display device **12** and the user input device **14** are each coupled to the cabinet assembly **18** and are each accessible by the player. In one embodiment, the gaming controller **16** is positioned within the cabinet assembly **18**. Alternatively, the gaming controller **16** may be separated from the cabinet assembly **18**, and connected to components of the gaming machine **10** through a network such as, for example, a local area network (LAN), a wide area network (WAN), dial-in-connections, cable modems, wireless modems, and/or special high-speed Integrated Services Digital Network (ISDN) lines.

In one embodiment, the user input device **14** includes a plurality of input buttons **24**, a coin slot **26**, and/or a bill acceptor **28**. The coin slot **26** includes an opening that is configured to receive coins and/or tokens deposited by the player into the gaming machine **10**. The gaming machine **10** converts a value of the coins and/or tokens to a corresponding amount of gaming credits that are used by the player to wager on games played on the gaming machine **10**.

The bill acceptor **28** includes an input and output device that is configured to accept a bill, a ticket, and/or a cash card into the bill acceptor **28** to enable an amount of gaming credits associated with a monetary value of the bills, ticket, and/or cash card to be credited to the gaming machine **10**. Moreover, the gaming machine **10** may also utilize a cashless wagering system (not shown), such as a ticket in ticket out (TITO) system (not shown). In one embodiment, the bill acceptor **28** also includes a printer (not shown) that is configured to dispense a printed voucher ticket that includes information indicative of an amount of credits and/or money paid out to the player by the gaming machine **10** during a gaming session. The voucher ticket may be used at other gaming machines, or redeemed for cash, and/or other items as part of a casino cashless system (not shown).

A coin tray **30** is coupled to the cabinet assembly **18** and is configured to receive a plurality of coins that are dispensed from the gaming machine **10**. One or more speakers **32** are installed inside the cabinet assembly **18** to generate voice announcements and/or sound effects associated with game play. The gaming machine **10** also includes one or more lighting devices **34** that are configured to blink and/or change brightness and color in specific patterns to produce lighting effects to enhance a visual gaming experience for the player.

In one embodiment, the input buttons **24** include a plurality of BET switches **36** for inputting a wager on a game, a plurality of selection switches **38** for selecting a betting line and/or card, a MAXBET switch **40** for inputting a maximum wager, a PAYOUT switch **42** for ending a gaming session and

dispensing accumulated gaming credits to the player, and a start switch, i.e., a SPIN/DEAL button **44** to initiate an output of a game.

In the illustrated embodiment, the BET switches **36** include five switches from 1BET to 5BET to enable a player to wager between a minimum bet up to 5× minimum bet. Each selection switch **38** corresponds to a betting line such as, for example, a payline and/or symbol for a reel game, one or more cards for a card game, and/or a symbol for a roulette game, to enable a player to associate a wager with one or more betting lines. The MAXBET switch **40** enables a player to input the maximum bet that a player can spend against one time of a game. The PAYOUT switch **42** enables a player to receive the amount of money and/or credits awarded to the player during a gaming session, which has been credited onto the gaming machine **10**.

The gaming machine **10** also includes a player tracking device **46** that is coupled to the gaming controller **16** for identifying the player and/or a player tracking account that is associated with the player. The player tracking account may include, but is not limited to, gaming credits available to the player for use in playing the gaming machine **10**. The player tracking device **46** is configured to communicate player account information between a player tracking controller (not shown) and the gaming machine **10**. For example, the player tracking device **46** may be used to track bonus points and/or credits awarded to the player during a gaming session and/or track bonus and/or credits downloaded to the gaming machine **10** from the player tracking system. In the illustrated embodiment, the player tracking controller assigns a player status, e.g. a player ranking, based on the player account information. For example, the player tacking information may include, but is not limited to, a frequency in which the player plays a game, the average wager the player makes per play of a game, a total amount wagered by the player over a predefined period of time, and/or any other suitable player tracking information. In addition, the player tracking controller may assign a player a higher player ranking based on a high average wager and/or a high total wager amount as compared with other tracked players. The gaming machine **10** may receive the player tracking information from the player tracking controller and determine the symbol selection factor based at least in part on the received player tracking information associated with the current player.

The player tracking device **46** is coupled to the gaming cabinet assembly **18** and includes a player identification card reader **48**, a data display **50**, and a keypad **52**. The player identification card reader **48** is configured to accept a player tracking card (not shown) inserted by the player, and read information contained on the player tracking card to identify the player account information. The player identification card reader **48** may include, but is not limited to, a barcode reader, a magnetic card reader, and/or a radio frequency identification (RFID) card reader. The keypad **52** is configured to accept a user selection input such as, for example, a unique player personal identification number (PIN) to facilitate enabling the gaming machine **10** to identify the player, and access player account information associated with the identified player to be displayed on the data display **50**. In one embodiment, the data display **50** includes a touchscreen panel that includes the keypad **52**. Alternatively, the data display **50** and the keypad **52** may be included in the display device **12**.

In one embodiment, the display device **12** includes a first display **54** and a second display **56**. The first display **54** is configured to display a game screen **58** (shown in FIG. **3**) including indicia and/or symbols for use in a game, e.g., cards used by a card game, roulette wheel and symbols used in a roulette game, and reels used in a reel game. The game screen **58** may include any type of game including, but not limited to, a video slot game, a keno game, a blackjack game, a video poker game, or any type of game which allows a player to make a wager, play a game, and potentially provide the player an award based on an outcome of the game and a paytable. The second display **56** is configured to display game play instructions for performing the game including, but not limited to, playing instructions, paytables, paylines, betting lines and/or any other information to enable the gaming machine **10** to function as described herein. Moreover, each display **54** and **56** may be configured to display at least a portion of the game screen **58** and/or game play instructions. In one embodiment, the first and second displays **54** and **56** each include a flat panel display, such as a cathode ray tube display (CRT), a liquid crystal display (LCD), a light-emitting diode display (LED), an organic light-emitting diode display (OLED), an active-matrix organic light-emitting diode display (AMOLED), a plasma display, and/or any suitable visual output device capable of displaying graphical data and/or text to a user. Alternatively, a single component, such as a touch screen, may function as both the display device **12** and as the user input device **14**. In an alternative embodiment, the first display **54** and/or the second display **56** includes a plurality of mechanical reels displaying a plurality of game symbols.

Referring to FIG. **2**, in one embodiment, the gaming controller **16** includes a processor, i.e., a central processing unit (CPU) **60**, a credit controller **62**, a console unit **64**, a payout controller **66**, a random-number generator (RNG) **68**, a lighting controller **70**, a sound controller **72**, a display controller **74**, a memory device **76**, and a database **78**. Memory device **76** includes a computer readable medium, such as, without limitation, random access memory (RAM), read-only memory (ROM), erasable programmable read-only memory (EPROM), flash memory, a hard disk drive, a solid state drive, a diskette, a flash drive, a compact disc, a digital video disc, and/or any suitable device that enables the CPU **60** to store, retrieve, and/or execute instructions and/or data.

The CPU **60** executes various programs, and thereby controls other components of the gaming controller **16** according to player instructions and data accepted by the user input device **14**. The CPU **60** in particular executes a game program, and thereby conducts a game in accordance with the embodiments described herein. The memory device **76** stores programs and databases used by the CPU **60**. Moreover, the memory device **76** stores and retrieves information in the database **78** including, but not limited to, wagers, wager amounts, average wagers per game, a game type, a number of reels associated with a game, a number of reel strips associated with each reel, a number of symbol positions being displayed on each reel strip, a type of symbols being displayed with each symbol position, a predefined set of normal symbols, a predefined set of special symbols, image data for producing game images and/or screens on the display device **12**, and temporarily stores variables, parameters, and the like that are used by the CPU **60**. In addition, the memory device **76** stores indicia, symbol weights, symbol values, selection probabilities tables which represent relationships between symbol selection probabilities and symbol selection factors, paytables, and/or winning combination tables which represent relationships between combinations of random numbers and types of awards. In one embodiment, the memory device **76** utilizes RAM to temporarily store programs and data necessary for the progress of the game, and EPROM to store, in advance, programs and data for controlling basic operation of the gaming machine **10**, such as the booting operation thereof.

The credit controller **62** manages the amount of player's credits, which is equivalent to the amount of coins and bills counted and validated by the bill acceptor **28**. The console unit **64** is coupled to the user input device **14** to monitor player selections received through the input buttons **24**, and accept various instructions and data that a player enters through the input buttons **24**. The payout controller **66** converts a player's credits to coins, bills, or other monetary data by using the coin tray **30** and/or for use in dispensing a credit voucher via the bill acceptor **28**.

The lighting controller **70** controls one or more lighting devices **34** to blink and/or change brightness and color in specific patterns in order to produce lighting effects associated with game play. The sound controller **72** controls the speakers **32** to output voice announcements and sound effects during game play. The display controller **74** controls the display device **12** to display various images on screens preferably by using computer graphics and image data stored in the memory device **76**. More specifically, the display controller **74** controls video reels in a game screen displayed on the first display **54** and/or the second display **56** by using computer graphics and the image data.

The RNG **68** generates and outputs random numbers to the CPU **60** preferably at the start of each round of a game. The CPU **60** uses the random numbers to determine an outcome of the games. For example, if the game is a video slot game, the CPU **60** uses the RNG **68** to randomly select an arrangement of symbols to be displayed on video reels. Moreover, the CPU **60** generally uses random numbers generated by the RNG **68** to play the games and to determine whether or not to provide an award to a player. In addition, the CPU **60** generates game outcomes including combinations of random numbers, and compares the generated combinations with winning combinations stored in the winning combination table to determine if the generated outcome is a winning outcome that is associated with a type of award.

With reference to FIG. **3**A, in one embodiment of the present invention game utilizes a set of game symbols **85**. In the illustrated embodiment, the set of games symbols **85** include: 10, J, Q, K, A, PIC e, PIC d, PIC c, PIC b, and PIC a. The set of game symbols are arranged in a predetermined order from lowest to highest. In the illustrated embodiment of FIG. **3**, the set of game symbols **85** are arranged from right to left with "10" being the lowest symbol and "PIC a" being the highest symbols.

FIG. **3**B is an exemplary graphical display of a game **80** that is displayed by the gaming machine **10**. In the illustrated embodiment, the gaming controller **16** is configured to display the game **80** on the display device **12**. In one embodiment, the game **80** is a video slot game. However, it should be noted that the game **80** may be any type of game upon which a player could make a wager including, but not limited to a keno game, a blackjack game, a video poker game, or any type of game that enables the gaming controller **16** to function as described herein. In the illustrated embodiment, the game **80** is displayed on the first display **54**. Alternatively, the game **80** may be displayed on the first display **54** and/or the second display **56**.

In general, during play of the game **80**, the gaming controller **16** randomly generates an initial outcome **82** of the game **80** and displays the generated game outcome **82** in a display area **84**. The gaming controller **16** randomly selects a plurality of game symbols **86** from the predefined set of possible game symbols **85**. In one embodiment, the gaming controller **16** displays the selected game symbols **86** associated with the initial game outcome **82** in the game display area **84**. In another embodiment, the initial game outcome **82** may not be displayed in the game display area **84**.

In the illustrated embodiment, the plurality of symbols **86** are displayed in a grid **88** having a plurality of symbol regions or cells **90** arranged along a plurality of rows **92** and a plurality of columns **94**. Each cell **90** displays a corresponding game symbol **86** associated with the initial game outcome **82**.

In one embodiment, the gaming controller **16** displays the game symbols **86** within a plurality of reels. In one embodiment, each cell **90** may correspond to an individual reel. In another embodiment, each column may correspond to an individual reel, i.e., the cells **90** of the column correspond to adjacent locations on the reel. In another embodiment, as discussed below, the grid **88** may include one or more individual reels corresponding to individual cells **90** and one or more column reels where all of the cells **90** in a column correspond to the same reel.

The game **80**, in the illustrated embodiment of FIGS. **3**B and **3**V, includes a 3×5 grid of individual reels, i.e., each cell **90** in the grid **88** corresponds to an individual reel.

The game **80** may also include a plurality of paylines **98** that extend across one or more cells **90** to indicate, to the player, a combination of game symbols **86**. In the illustrated embodiment three horizontal paylines **98** are shown. However, as will be recognized by one skilled in the art, any number and shape of paylines may be utilize.

Each slot game is generally played in a conventional manner. The player makes a wager, which may be based on a predetermined denomination and a selected number of paylines, the gaming controller **16** randomly generates an outcome for the game, spins the reels, and selectively stops the reels to display a game symbol **86** in each of the display cells **90**. If a predetermined pattern of symbols **86** is randomly chosen for each cell **90** on a played payline **98**, the player may be awarded a payout based on the payline, the wager, and a predetermined paytable. Moreover, the player may be awarded a payout if the combination of symbols associated with a selected payline is a winning combination. In addition, a player may receive a bonus feature and/or a bonus game based on the combination of symbols associated with the selected payline and/or the appearance of one or more predefined symbols in the game outcome **82**. Many variations to the above described general play of a slot game fall within the scope of the present invention. Such slot games are well-known in the art, and are therefore not further discussed.

In the illustrated embodiment, the gaming controller **16** receives a signal, from the user input device **14**, that is indicative of a player's selection to initiate a gaming session including a wager amount, and a selection of one or more paylines **98** associated with a predefined set of cells **90** within the displayed grid **88**. In the illustrated embodiment, the game **80** is a multi-line game, i.e., the paylines include horizontal paylines and/or diagonal pay-lines, and/or zig-zag paylines. Moreover, the user input device **14** may allow the player to toggle to increase the bet per payline a credit at a time (up to the maximum bet). The gaming controller **16** randomly generates an outcome **82** of the game **80**, and displays the generated outcome **82** on the display device **12**. In one embodiment, the gaming controller **16** is configured to rotate, and/or spin each reel to initiate a game play, and stop each reel to display a plurality of symbols **86** associated with the randomly generated outcome **82**. In addition, the gaming controller **16** is adapted to determine if the generated outcome **82** is a winning outcome based on the displayed game symbols **86**, a pay-table, a wager, and one or more player selected paylines **98**. More specifically, the gaming controller **16** determines if a combination of symbols **86** arranged along the

selected payline **98** is a winning combination. The gaming controller **16** may provide an award in response to the outcome **82** of the game **80**. In general, the term "award" may be a payout, in terms of credits or money. Thus, the gaming controller **16** may award a regular payout in response to the outcome **82** of the game **80**. However, it should be noted that the term award may also refer to other types of awards, including, prizes, e.g., meals, show tickets, etc. . . . , as well as in-game award, such as free games or awarding the player one or more wild symbols or stacked wild symbols in each of the games.

Returning to FIG. **3**A, in the first illustrated embodiment, as discussed above, the display device **12** is configured to display a plurality of symbol regions **90**. In the illustrated embodiment, the grid **88** includes 15 symbol regions **90**A, **90**B, **90**C, **90**D, **90**E, **90**F, **90**G, **90**H, **90**I, **90**J, **90**K, **90**L, **90**M, **90**N, **90**O. The controller **16** is coupled to the display device **12** and is configured to randomly select an initial outcome **82** of the game **80**. As shown, the initial outcome **82** of the game **80** includes an initial game symbol **86** associated with each of the symbol regions **90**.

In one embodiment, the initial game outcome **82** is displayed in the grid **88**. In another embodiment the initial game outcome **82** is not displayed.

The controller **16** is further configured to detect a triggering condition associated with the initial outcome **82** of the game **80**. The initial game condition may be a predetermined winning condition, a predetermined outcome or arrangement of symbols within the grid **82**, an appearance of one or more or a predetermined number of scatter symbols (see below), or any other triggering condition.

If the triggering condition is detected by the controller **16**, the controller **16** replaces the initial game symbol **86** in the initial outcome **82** in at least one predetermined symbol region **90** with a replacement symbol to establish a secondary outcome of the game **83**. The at least one predetermined symbol region **90** may be one or more of the symbol regions **90**. The at least one predetermined symbol region **90** may be constant for all instances of the game **80** or may vary based on a predetermined factor or may be randomly determined before each play of the game **80**.

With particular reference to FIG. **3**C, in the illustrated embodiment the at least one predetermined symbol region **90** includes three symbol regions **90**B, **90**D, **90**F which are also shown with dashed lines.

The replacement symbol(s) **90** are determined as a function of the initial symbol **90** and the predetermined order **85** of the game symbols **86**.

For instance, each replacement symbol **86** could be determined as an offset from the initial symbol **86**. The offset could be negative or positive. In other words, the replacement symbol could be lower than the initial symbol or higher than the initial symbol. The offset could be constant or vary per game instance. The offset may be the same or different for every predetermined symbol region **90**.

In the illustrated embodiment of FIGS. **3**B-**3**C, the offset is a +3. Thus, every initial symbol **86** in a predetermined symbol region **90** is replaced with a replacement symbol **90** which is 3 symbols higher in the predetermined ranking **85**. Thus, the Q symbol in symbol region **90**B is replaced with a PIC e symbol; the A symbol in symbol region **90**D is replaced with a PIC c symbol; and the K symbol in symbol region **90**F is replaced with a PIC d symbol.

As discussed above, the gaming machine **10** allows the player to make a wager. The controller **16** may be further configured to award the player an initial award as a function of the wager, the initial outcome and an initial paytable. The controller **16** may be further configured to award a secondary award as a function of the secondary outcome and a secondary paytable. The secondary paytable may be the same or different than the initial paytable. In an alternative embodiment, the controller **16** only awards an award based on the secondary outcome, the wager and a paytable.

In one embodiment, the display device **12** is configured to display the initial outcome **82** and the secondary outcome **83** in the grid **88**. In another embodiment, only the secondary outcome **83** is displayed.

In a second exemplary embodiment, the grid **88** has a plurality of columns **94**. Each column **94** includes at least two symbol regions **90**. With reference to FIGS. **3**D and **3**E (in which similar elements are labeled with similar reference numbers), in one illustrated embodiment, the grid **88** is a 3×5 grid, with 5 columns **94**. Each column **94** includes 3 symbol regions. At least one of the columns **94** forms a single reel. Each of the other symbol regions **90** is an individual reel.

For example, in the illustrated embodiment of FIGS. **3**D and **3**E, each of the first two columns **94** form a single reel. In other words, symbol regions **90**A, **90**B, **90**C represent adjacent symbol positions on a single reel and symbol regions **90**D, **90**E, **90**F form another single region. Thus, the symbols **86** within the outcomes **82**, **83** in symbol regions **90**A, **90**B, **90**C correspond to adjacent locations on a virtual reel strip associated with a first reel. Likewise, the symbols **86** within the outcomes **82**, **83** in symbol regions **90**D, **90**E, **90**F correspond to adjacent locations on a virtual reel strip associated with a second reel. Each of the symbol regions **90**G-**90**O represent individual reels. This, the symbols **86** in symbol regions **90**G-**90**O within the outcomes **82**, **83** are independent from each other.

The symbol regions **90** within the single reel formed by the symbol regions **90** in at least one column are the predetermined symbol regions **90**. Thus, if the controller **16** detects the triggering condition, all of the symbols **86** in the symbol regions or cells **90** in the at least column are replaced with replacement symbols **86**.

FIG. **3**D illustrates an initial outcome **92**, each of the first and second columns **94** form a single reel. All of the other symbol regions **90**G-**90**O are formed as individual reels. As discussed above, in one embodiment the initial outcome **82** is displayed and may be evaluated to determine if there is a winning combination, e.g., a predetermined combination of symbols on a played payline. If the triggering condition is detected in the initial outcome **82**, then the symbols **86** located in regions **90**A-**90**F (shown in dashed lines) are replaced with replacement symbols **86** to form a secondary outcome **83** as shown in FIG. **3**E.

The replacement symbol(s) **90** are determined as a function of the initial symbol **90** and the predetermined order **85** of the game symbols **86**.

For instance, each replacement symbol **86** could be determined as an offset from the initial symbol **86**. The offset could be negative or positive. In other words, the replacement symbol could be lower than the initial symbol or higher than the initial symbol. The offset could be constant or vary per game instance. The offset may be the same or different for every predetermined symbol region **90**.

In the illustrated embodiment of FIGS. **3**D-**3**E, the offset is a +3. Thus, every initial symbol **86** in the predetermined symbol regions **90**A-**90**F is replaced with a replacement symbol **90** which is 3 symbols higher in the predetermined ranking **85**. If the highest symbol **90** is reached prior to reaching the offset than in one embodiment, the highest symbol (PIC a) is used. In another embodiment, the offset is continued starting at the lowest symbol.

Thus, the PIC e symbol in symbol region **90**A is replaced with a PIC b symbol; the Q symbol in symbol region **90**B is replaced with a PIC e symbol; the PIC b symbol in symbol region **90**C is replaced with a PIC a symbol; the A symbol in region **90**D is replaced with a PIC c symbol; the PIC c symbol in region **90**E is replaced with a PIC a symbol; and the K symbol in region **90**F is replaced with a PIC d symbol.

The replaced symbols **86** in symbol regions **90**A-**90**F plus the initial symbols **86** in regions **90**G-**90**O form the secondary outcome **83**. In one embodiment, the controller **16** evaluates the secondary outcome **83** and may award the player an award based on the secondary outcome **83**, the player's wager and a paytable.

With reference to FIG. **10** in another aspect of the present invention, a method **200** of providing a game to a player on a gaming machine **10** having a display device **12** is shown. The game has an associated set of game symbols **85**. The game symbols **85** in the set of game symbols are arranged in a predetermined order from lowest to highest. In a first step **202**, a plurality of symbol regions **90** are displayed on the display device **12**. The plurality of symbol regions are arranged in a grid **88**. In a second step **204**, an initial outcome of the game is randomly selected. The initial outcome of the game includes an initial game symbol **86** associated with each of the symbol regions **90**. In a third step **206**, a triggering condition associated with the initial outcome of the game is detected. If the triggering condition is detected, in a fourth step **206** the initial game symbol in at least one predetermined symbol region is replaced with a replacement symbol to establish a secondary outcome of the game. The replacement symbol is determined as a function of the initial symbol and the predetermined order of the game symbols.

INDUSTRIAL APPLICABILITY

With reference to FIGS. **4**-**9** (in which similar elements are labeled with similar reference numbers), some of the concepts of the present invention are embodied in a game having a theme and title of "Exotic Princess".

With particular reference to FIG. **4**, the game **80** includes a 3×5 grid **88** formed by symbol regions **90**A-**90**O arranged in rows **92** and columns **94**. The grid **88** has a plurality of associated reels. Each reel has an associated virtual reel strip (not shown) having a predetermined arrangement of game symbols. The outcomes of the game **80** includes one symbol **86** on the associated virtual reel strip being located in, and displayed in, a corresponding symbol region **90**.

With particular reference to FIG. **5**, the Exotic Princess game **80** uses ten symbols **86** arranged from left to right from lowest to highest. In the illustrated embodiment, the symbols **86** used in the Exotic Princess from lowest to highest are: 9, 10, J, Q, K, A, Lamp, Coins, Cobra, Horse, Jewel, Princess.

Returning to FIG. **4**, in the Exotic Princess game **80**, each of the first and second columns **94** form a single reel (as indicated or marked by first frame **94**A and second frame **94**B). In other words, a first virtual reel strip (not shown) is associated with the first column **94**. When the virtual reel strip is in a stopped condition, adjacent symbols on the reel strip appear in regions **90**A-**90**C. Likewise, a second virtual reel strip (not shown) is associated with the second column **94**. When the second virtual reel strip is in a stopped location, adjacent symbols on the second reel strip appear in regions **90**D-**90**F.

The first and second virtual reel strips may include a predetermined set of adjacent symbols which include the same symbol, i.e., a symbol stack. The symbol stack may be visualized by a plurality of the same symbol **86**, one in each region **90** of the symbol stack. Alternatively, a large symbol or graphic (see FIGS. **6** and **7**) may be used to represent the stack. The symbol in the symbol stack may be static or may be dynamic.

In the Exotic Princess game **80**, each of the other symbol regions **90**G-**90**O have an associated, separate virtual reel strip, such that the symbol **86** appearing in each symbol regions **90**G-**90**O is independent from each other.

The Exotic Princess game **80** has a main game and a bonus game. In the illustrated embodiment bonus game includes a number of free spins. The bonus game is initiated when a bonus triggering condition occurs in the main game.

In one embodiment, the triggering condition is the appearance of a predetermined symbol. In the Exotic Princess game, the predetermined symbol is a scatter symbol.

In an alternative embodiment, the triggering condition is the appearance of the predetermined symbol in the initial outcome of the game. The predetermined symbol is one of the game symbols, i.e., one of the symbols in the set of game symbols.

In one aspect of the present invention, each replacement symbol is determined as a function of an offset from the associated initial symbol in the predetermined order. In one embodiment, the offset is equal to the number of predetermined symbols. For example, if the 1 predetermined symbol appears, then the offset is +1. If 2 predetermined symbols appear, then the offset is +2.

With reference to FIG. **4**, in one embodiment, one or more of the columns **94** includes a virtual triggering reel. The virtual triggering reel overlays all of the cells **90** in the respective column **94**. In the illustrated embodiment of FIG. **4**, each of the third, fourth, and fifth columns **94** includes a virtual triggering reel **95**. Each virtual triggering reel has a single scatter symbol **89** (see FIG. **9**). The virtual triggering reels **95** are spun during the main game.

In one embodiment, if three scatter symbols **89** appear in the initial outcome of the main game **82**, then a number of free spins are awarded. In one embodiment, the three scatter symbols **90** must appear on the middle row (as shown in FIG. **4**).

In another aspect of the invention, the scatter symbols **89** may also be used to trigger the symbol upgrade feature. For example, the upgrade feature may be triggered by any number of scatter symbols **89** appearing in the initial outcome **82**. In one embodiment, the scatter symbols **89** may be located in any one of the cells **90**G-**90**O to trigger the upgrade feature. In another aspect of the present invention, the number of scatter symbols **89** appearing in the initial outcome **82** is used to determine the number of symbol upgrades. For example, if one scatter symbol **90** appears in the initial outcome **82**, then the initial symbols **89** in the at least one predetermined symbol regions **90** are upgraded by +1, i.e., replaced by a replacement symbol **89**. If two scatter symbols **90** appear in the initial outcome **82**, then the symbols in the at least one predetermined symbol regions **90** are upgrade by +2. If three scatter symbols **90** appear in the initial outcome **82**, then the symbols in the at least on predetermined symbol regions **90** are upgrade by +3. In the illustrated embodiments, the initial symbols **88** in cells **90**A-**90**F are upgraded, i.e., replaced by a replacement symbol.

In aspect of the present invention, during the bonus game, e.g., the free spins, additional free spins may be award. Also, the upgrade feature may be awarded during the free spins. Alternatively, the upgrade feature may be award only during the free spins.

With reference to FIGS. **6** and **8**, a second scatter symbol **87** may be used during the bonus game. As in the main game, the appearance of a predetermined number, e.g., 3, of scatter

symbols **87** in the initial outcome of the bonus game (or free spin), may trigger the award of additional free spins (see FIG. **6**). Additionally, as can be seen in FIG. **6**, a stack of symbols may appear in the first two columns **94**. FIG. **6** shows an exemplary secondary outcome in which the symbols **86** in the first two columns **94** have been upgraded +3 based on the number of scatter symbols.

With reference to FIG. **7**, an exemplary initial outcome **82** of a bonus game or free spin. In this example, the large symbols (the cobra symbol) will be upgraded by +3 to the princess symbol.

Alternative Embodiment

In an alternative embodiment, the upgrade feature may be triggered during a re-spin feature. For example, in one embodiment, one of the symbols in the set of game symbols may be designated as a re-spin trigger symbol **91** (see FIG. **11**). If during a play of a video slot game, the one or more re-spin trigger symbols **91** appear in the outcome of the game, the player is awarded a number of re-spins. The number of re-spins may be equal to the number of re-spin trigger symbols **91** that appear in the outcome of the game. During the re-spin feature, the re-spin trigger symbol **91** is transformed into one of the other game symbols in the set of game symbols.

In one embodiment, the reels which contained the transformed re-spin trigger symbols **91** are held. Additionally, reels containing one or more others of the game symbols may also be held. All other reels are re-spun.

In one aspect of the present invention, the upgrade feature may be triggered during the re-spin feature. In one embodiment, the triggering condition for the upgrade feature is the appearance of a predetermined number of a predetermined one of the game symbols in the set of game symbols. In another aspect of the present invention, the number of upgrades is equal to the number of re-spins remaining. For example, if the triggering condition occurs during a re-spin and there are 2 re-spins remaining, then the number of upgrades is equal to the number of re-spins remaining.

Exemplary embodiments of a gaming machine and a method of allowing a player to play a gaming machine are described above in detail. The gaming machine, system, and method are not limited to the specific embodiments described herein, but rather, components of the gaming machine and/or system and/or steps of the method may be utilized independently and separately from other components and/or steps described herein. For example, the gaming machine may also be used in combination with other gaming systems and methods, and is not limited to practice with only the gaming machine as described herein. Rather, an exemplary embodiment can be implemented and utilized in connection with many other gaming system applications.

A controller, computing device, or computer, such as described herein, includes at least one or more processors or processing units and a system memory. The controller typically also includes at least some form of computer readable media. By way of example and not limitation, computer readable media may include computer storage media and communication media. Computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology that enables storage of information, such as computer readable instructions, data structures, program modules, or other data. Communication media typically embody computer readable instructions, data structures, program modules, or other data in a modulated data signal such as a carrier wave or other transport mechanism and include any information delivery media. Those skilled in the art should be familiar with the modulated data signal, which has one or more of its characteristics set or changed in such a manner as to encode information in the signal. Combinations of any of the above are also included within the scope of computer readable media.

The order of execution or performance of the operations in the embodiments of the invention illustrated and described herein is not essential, unless otherwise specified. That is, the operations described herein may be performed in any order, unless otherwise specified, and embodiments of the invention may include additional or fewer operations than those disclosed herein. For example, it is contemplated that executing or performing a particular operation before, contemporaneously with, or after another operation is within the scope of aspects of the invention.

In some embodiments, a processor, as described herein, includes any programmable system including systems and microcontrollers, reduced instruction set circuits (RISC), application specific integrated circuits (ASIC), programmable logic circuits (PLC), and any other circuit or processor capable of executing the functions described herein. The above examples are exemplary only, and thus are not intended to limit in any way the definition and/or meaning of the term processor.

In some embodiments, a database, as described herein, includes any collection of data including hierarchical databases, relational databases, flat file databases, object-relational databases, object oriented databases, and any other structured collection of records or data that is stored in a computer system. The above examples are exemplary only, and thus are not intended to limit in any way the definition and/or meaning of the term database. Examples of databases include, but are not limited to only including, Oracle® Database, MySQL, IBM® DB2, Microsoft® SQL Server, Sybase®, and PostgreSQL. However, any database may be used that enables the systems and methods described herein. (Oracle is a registered trademark of Oracle Corporation, Redwood Shores, Calif.; IBM is a registered trademark of International Business Machines Corporation, Armonk, N.Y.; Microsoft is a registered trademark of Microsoft Corporation, Redmond, Wash.; and Sybase is a registered trademark of Sybase, Dublin, Calif.)

This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Other aspects and features of the present invention can be obtained from a study of the drawings, the disclosure, and the appended claims. The invention may be practiced otherwise than as specifically described within the scope of the appended claims. It should also be noted, that the steps and/or functions listed within the appended claims, notwithstanding the order of which steps and/or functions are listed therein, are not limited to any specific order of operation.

Although specific features of various embodiments of the invention may be shown in some drawings and not in others, this is for convenience only. In accordance with the principles of the invention, any feature of a drawing may be referenced and/or claimed in combination with any feature of any other drawing.

What is claimed is:

1. A gaming machine configured to allow a player to play a game, the game having an associated set of game symbols, the

game symbols in the set of game symbols being arranged in a predetermined order from a lowest value to a highest value, comprising:

a display device configured to display a plurality of symbol regions, the symbol regions being arranged in a grid, the display device being further configured to display one of the plurality of game symbols in each of the symbol regions; and,

a controller coupled to the display device and being configured to randomly select an initial game symbol associated with one of the symbol regions, the controller being further configured to detect a triggering condition and to responsively determine a ranking of the initial game symbol within the predetermined order of game symbols, determine an offset from the initial game symbol within the predetermined order of game symbols, and replace the initial game symbol with a replacement symbol the replacement symbol being determined as a function of the ranking of the initial game symbol within the predetermined order of the game symbols and the determined offset from the initial game symbol ranking, the controller, including a credit input device, allowing the player to make a wager and awarding the player an award as a function of the wager, an outcome and a paytable.

2. The gaming machine of claim **1**, wherein the outcome is an initial outcome and the paytable is an initial paytable.

3. The gaming machine of claim **2**, the controller awarding a secondary award as a function of a secondary outcome and a secondary paytable.

4. The gaming machine of claim **2**, the, wherein the initial paytable and the secondary paytable are different.

5. The gaming machine of claim **1**, the controller awarding the player an award as a function of the wager, a secondary outcome and a secondary paytable.

6. The gaming machine of claim **1**, the controller displaying the initial outcome and a secondary outcome in the grid.

7. The gaming machine of claim **1**, wherein the grid has a plurality of columns, each column having at least two symbol positions.

8. The gaming machine of claim **7**, wherein the at least two symbol positions of at least one of the columns form a single reel.

9. The gaming machine of claim **8**, wherein each of the at least two symbol positions of at least one other of the columns form an individual reel.

10. The gaming machine of claim **9**, the at least two symbol regions of any single reel are predetermined symbol regions in which the initial symbols are replaced with replacement symbols if the triggering condition is detected.

11. The gaming machine of claim **10**, wherein each replacement symbol is determined as a function of a set offset from the associated initial symbol in the predetermined order.

12. The gaming machine of claim **11**, wherein the each replacement symbol is higher in order than the initial symbol along the predetermined order.

13. The gaming machine of claim **1**, wherein the triggering condition is the appearance of a predetermined symbol.

14. The gaming machine of claim **13**, wherein the predetermined symbol is one of the symbols in the set of game symbols and the triggering condition is the appearance of the predetermined symbol in an initial outcome of the game.

15. The gaming machine of claim **13**, wherein the predetermined symbol is a scatter symbol.

16. The gaming machine of claim **13**, wherein the each replacement symbol is determined as a function of an offset from the associated initial symbol in the predetermined order.

17. The gaming machine of claim **16**, wherein the offset is equal to the number of predetermined symbols.

18. The gaming machine of claim **16**, wherein the triggering condition occurs in a re-spin feature and the offset is equal to a number of re-spins remaining.

19. A method of providing a game to a player on a gaming machine having a display device and a controller, the game having an associated set of game symbols, the game symbols in the set of game symbols being arranged in a predetermined order from a lowest value to a highest value, the method including the steps of:

the controller displaying on the display device a plurality of symbol regions, the symbol regions being arranged in a grid;

the controller randomly selecting an initial game symbol associated with one of the symbol regions;

the controller detecting a triggering condition and responsively determining a ranking of the initial game symbol within the predetermined order of game symbols, determining an offset from the initial game symbol within the predetermined order of game symbols, and replacing the initial game symbol with a replacement symbol, the replacement symbol being determined as a function of the ranking of the initial symbol within the predetermined order of the game symbols and the determined offset from the initial game symbol ranking; and,

the controller, including a credit input device, allowing the player to make a wager and awarding the player a award as a function of the wager, an outcome, and an initial payment.

20. The method of claim **19**, wherein the outcome is an initial outcome and the paytable is an initial paytable.

21. The method of claim **20**, the controller awarding a secondary award as a function of a secondary outcome and a secondary paytable.

22. The method of claim **21**, wherein the initial paytable and the secondary paytable are different.

23. The method of claim **20**, the controller awarding the player an award as a function of the wager, a secondary outcome and a secondary paytable.

24. The method of claim **19**, the controller displaying the initial outcome and a secondary outcome in the grid.

25. The method of claim **19**, wherein the grid has a plurality of columns, each column having at least two symbol positions.

26. The method of claim **25**, wherein the at least two symbol positions of at least one of the columns form a single reel.

27. The method of claim **26**, wherein each of the at least two symbol positions of at least one other of the columns form an individual reel.

28. The method of claim **27**, the at least two symbol regions of any single reel are predetermined symbol regions in which the initial symbols are replaced with replacement symbols if the triggering condition is detected.

29. The method of claim **28**, wherein each replacement symbol is determined as a function of a set offset from the associated initial symbol in the predetermined order.

30. The method of claim **29**, wherein the each replacement symbol is higher in order than the initial symbol along the predetermined order.

31. The method of claim **19**, wherein the triggering condition is the appearance of a predetermined symbol.

32. The method of claim **31**, wherein the predetermined symbol is one of the symbols in the set of game symbols and the triggering condition is the appearance of the predetermined symbol in an initial outcome of the game.

33. The method of claim 31, wherein the predetermined symbol is a scatter symbol.

34. The method of claim 31, wherein the each replacement symbol is determined as a function of an offset from the associated initial symbol in the predetermined order.

35. The method of claim 34, wherein the offset is equal to the number of predetermined symbols.

36. The method of claim 34, wherein the triggering condition occurs in a re-spin feature and the offset is equal to a number of re-spins remaining.

37. The method of claim 19 wherein the triggering condition is a predetermined winning condition, a predetermined outcome or arrangement of symbols within the grid, an appearance of one or more or a predetermined number of scatter symbols, or any other triggering condition.

38. A non-transitory information recording medium on which a computer readable program is recorded that causes a computer to function as a gaming machine being configured to allow a player to play a game, the game having an associated set of game symbols, the game symbols in the set of game symbols being arranged in a predetermined order from a lowest value to a highest value, the program causing the computer to function as a:

a controller coupled to a display device, the display device configured to display a plurality of symbol regions, the symbol regions being arranged in a grid, the display device being further configured to display one of the plurality of game symbols in each of the symbol regions, the controller being configured to randomly select an initial game symbol associated with one of the symbol regions, the controller being further configured to detect a triggering condition and to responsively determine a ranking of the initial game symbol within the predetermined order of game symbols, determine an offset from the initial game symbol within the predetermined order of game symbols, and replace the initial game symbol with a replacement, the replacement symbol being determined as a function of the ranking of the initial game symbol within the predetermined order of the game symbols and the determined offset from the initial game symbol ranking, the controller, including a credit input device, allowing the player to make a wager and awarding the player an award as a function of the wager, an outcome and a paytable.

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